

WHAT IS CLAIMED IS:

1. A vibrating knife comprising an excision portion which is brought into contact with a target and vibrated in a direction at an angle to a traveling direction in excision so as to excise the target, wherein a surface of said excision portion which is located on a forward side in the traveling direction in excision is hydrophobic, and a surface of said excision portion which is located on a backward side in the traveling direction in excision is hydrophilic.
2. The knife according to claim 1, wherein the hydrophobic surface and the hydrophilic surface are respectively coated with a hydrophobic film and a hydrophilic film.
3. A vibrating knife comprising:
 - an excision portion which is brought into contact with a target and vibrated in a direction at an angle to a traveling direction in excision so as to excise the target;
 - a coating which is formed on a surface of said excision portion and changes in property to hydrophobicity or hydrophilicity depending on a temperature; and
 - a heater which is provided on a portion of said excision portion which is located on a forward side in the traveling direction in excision, and supplies heat to said coating.

4. The knife according to claim 3, wherein said heater comprises a self temperature control type heater.

5. The knife according to claim 3, wherein said
5 coating exhibits the change in property at a temperature higher than a storage temperature for the target and lower than a temperature at which the target deteriorates.

6. A vibrating knife comprising:

10 an excision portion which is brought into contact with a target and vibrated in a direction at an angle to a traveling direction in excision so as to excise the target;

a coating which is formed on a surface of said
15 excision portion and changes in property to hydrophilicity or hydrophobicity depending on a temperature; and

a vibration enlarging portion which is provided on a portion of said excision portion which is located
20 on a forward side in the traveling direction in excision to enlarge the vibration.

7. The knife according to claim 6, wherein a vibration amplitude of the portion of said excision portion which is located on the forward side in the
25 traveling direction in excision is enlarged by said vibration enlarging portion.

8. The knife according to claim 6, wherein said

coating exhibits the change in property at a temperature higher than a storage temperature for the target and lower than a temperature at which the target deteriorates.

5 9. An excision apparatus comprising:

 a vibrating knife defined in claim 1;

 a knife driving portion which vibrates said vibrating knife; and

 a driving control portion which controls said
10 knife driving portion to control a vibration mode of said vibrating knife.

10. The apparatus according to claim 9, wherein said driving control portion controls the vibration mode of said vibrating knife to generate elliptic vibration
15 whose ellipsoid coincides with the traveling direction in excision of said vibrating knife.

11. An excision apparatus comprising:

 a vibrating knife defined in claim 1;

 a knife driving portion which vibrates said
20 vibrating knife; and

 a temperature control portion which controls generation of heat by said heater of said vibrating knife.

12. An excision apparatus comprising:

25 a vibrating knife defined in claim 6; and

 a knife driving portion which vibrates said vibrating knife.

13. A method of manufacturing a vibrating knife,
comprising the steps of:

forming an excision portion which is brought into
contact with a target and vibrated in a direction at an
5 angle to a traveling direction in excision so as to
excise the target;

forming a hydrophobic film on a surface of a
portion of the excision portion which is located on a
forward side in the traveling direction in excision;

10 and

forming a hydrophilic film on a surface of a
portion of the excision portion which is located on a
backward side in the traveling direction in excision.

14. A method of manufacturing a vibrating knife,
15 comprising the steps of:

forming an excision portion which is brought into
contact with a target and vibrated in a direction at an
angle to a traveling direction in excision so as to
excise the target;

20 forming, on a surface of the excision portion, a
film whose property changes to hydrophobicity or
hydrophilicity depending on temperature; and

mounting, on a portion of the excision portion
which is located on a forward side in the traveling
25 direction in excision, a heater which supplies heat to
the film.

15. A method of manufacturing a vibrating knife,

comprising the steps of:

forming an excision portion which is brought into contact with a target and vibrated in a direction at an angle to a traveling direction in excision so as to

5. excise the target;

forming, on a surface of the excision portion, a film whose property changes to hydrophilicity or hydrophobicity depending on temperature; and

forming, on a portion of the excision portion
10 which is located on a forward side in the traveling direction in excision, a vibration enlarging portion which enlarges the vibration.